Draft
Small Residential Fuel Oil Spill Guidance Document

Waste Management Division
Site Remediation Programs

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References:

New Hampshire Code of Administrative Rules Env-Wm 1403
New Hampshire Code of Administrative Rules Env-Ws 412
New Hampshire Code of Administrative Rules Part Odb 401
NHDES Contaminated Sites Risk Characterization and Management Policy January 1998
NHDES Residential Indoor Air Assessment Guidance Document Revised March 2000
NH Petroleum Reimbursement Fund Program Report on Prevailing Market Rates

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1.0 Introduction

The New Hampshire Department of Environmental Services (DES) Initial Response Section has responded to and overseen the cleanup of small residential fuel oil spills for over a decade. Residential fuel oil spills can occur from overfills, leaking aboveground or underground fuel tanks, sub-slab line leaks, accidents, or other spill/release scenarios. Spills can affect human health and the environment by contaminating groundwater, surface water, and drinking water supplies, and by exposure through dermal contact with contaminated media or inhalation of contaminant vapors. Due to the nature of residential spills, most sites are cleaned-up during the Emergency and/or Initial Response phases. At these sites, the risks are similar; the spills are typically small, less than 275 gallons, and the spills require prompt action.

Using the experience of the last decade DES has established this "Draft Small Residential Fuel Oil Spill Guidance Document", herein after the guidance document. The purpose of the guidance document is to streamline the corrective action process at residential spill sites, while preserving the solvency of the New Hampshire Petroleum Reimbursement Fund (Fund) by encouraging prompt remediation of petroleum contamination in a technologically sound and cost-effective manner. The guidance document is designed to assist DES staff, contractors, consultants and responsible parties when conducting corrective action at residential spill sites in an effort to fast track sites to closure consistent with "Reporting and Remediation of Oil Discharges" *Env-Ws 412*.

The Fuel Oil Discharge Cleanup Fund, under RSA 146-E, (Fund) provides financial assistance for owners of petroleum storage facilities who incur clean up costs when a release (spill or leak) occurs. To qualify for Fund coverage, residential on-premise-use facilities (OPUF) must be equipped with a vent (overfill) alarm system. New facilities installed after August 1993 must meet National Fire Protection Association Chapter 31 and must meet all applicable local codes for facility operation and maintenance. The Fund is considered "excess insurance" under the statute. Therefore, if a facility owner holds a policy of insurance, claims must first be submitted to the owner's insurance carrier to determine if there is coverage.

2.0 Corrective Action Process

2.1 Emergency Services

For the purposes of the guidance document, "Emergency Services" means corrective action performed to mitigate an immediate threat to human health or the environment. Emergency services includes responding to one or more of the following conditions: dangerous or explosive levels of vapors in buildings or confined spaces; free phase product present in significant quantities; contamination or imminent threat of contamination to drinking water supplies. When conducting corrective action at residential spill sites the goal of emergency services shall be to stop the discharge, and stabilize, treat, control, and minimize threats to public health and the environment.

Emergency services conducted at residential spill sites does not require written pre-approval for the costs to be eligible for reimbursement provided the work was necessary, the costs are reasonable and the facility owner/applicant is eligible to receive reimbursement from the Fund. However, DES verbal authorization is necessary to confirm that the emergency service actions being taken are necessary and reimbursable.

2.2 Initial Response Actions

In an effort to fast track sites to closure, when conducting corrective action at residential spill sites, the initial response actions should focus on source removal to the extent practicable. DES does not require removal of foundations, load bearing walls or other appurtenances that may undermine the structural integrity of the home when conducting source removal activities.

Once a release has been documented, source removal should be conducted as soon as possible to limit migration of the fuel oil. By responding quickly to spills, the overall cleanup costs may be reduced considerably.

Initial response actions may include but are not limited to the following:

1. collection of soil, groundwater, soil gas, and/or indoor air samples;
2. installation of drainage controls;
3. covering, capping or restricting access to contaminated soils or other contaminated media;
4. free product recovery;
5. removal of contaminated soils;
6. installation of vapor barriers, or soil venting systems;
7. installation of ventilation fans;
8. other appropriate site control measures; and
9. limited investigations including groundwater monitoring to evaluate the efficacy of source removal actions.

Initial response actions conducted at residential spill sites require pre-approval for the costs to be eligible for reimbursement. Pre-approval is obtained by submitting costs to DES using the "Authorization for Initial Response Action Form".

2.2.1 Soil Excavation

The quickest and most common source removal activity is soil excavation. Upon completion of soil excavation activities, composite soil sampling shall be conducted to document the concentration of left-in-place soils.

If the composite sample(s) exceeds DES S-1 soil standards and the soil is inaccessible and must be left-in-place due to structural or other physical reasons, additional monitoring activities may be required to demonstrate there is no risk to human health and the environment in order to meet site closure criteria as described in Section 3.0. In cases where contaminated soils are left in-place due to structural or other physical reasons, the total volume shall be estimated and included on the "Initial Response Action Report Form".

Where soil excavation is not cost effective or feasible, other source removal and/or corrective action should be considered, including but not limited to free product removal, soil venting, or monitored natural attenuation. Additional monitoring activities may be required to obtain site closure as described in Section 3.0.

2.2.2 Initial Response Investigations

Where the aerial extent of contamination is unknown or not apparent from observations or other information, limited investigations may be necessary prior to conducting source removal activities. DES has established two pre-approved limited investigation scopes of work (SOW) that may be used during the initial response phase; *Sub-slab Source Investigation* and *Soil Excavation Delineation Sampling*.

Prior to performing source removal activities for interior sub-slab spills, source characterization may be completed using the pre-approved *Sub-slab Source Investigation* task. This task should be used to identify if source removal is necessary and if so, the proposed limits of soil excavation work. This SOW consists of completing corings through the concrete floor to obtain soil samples, screening soils with a PID, submitting soil samples for laboratory analysis as directed by DES, and completing a data submittal. The data submittal shall include a sketch showing sample locations, PID data, and copies of laboratory data.

If there is an exterior spill and the aerial extent of the spill is not evident, then source investigation may be needed prior to conducting source removal activities. In these situations source characterization can be completed during the Initial Response phase using the pre-approved *Soil Excavation Delineation Sampling* task. This task should be used to identify if source removal is necessary and if so, the proposed limits of soil

excavation work. This SOW consists of completing the following or as otherwise directed by DES: complete soil borings, or test pitting to define the extent of soil contamination, and submit soil samples for analysis and complete a data submittal. The data submittal shall include: a site sketch showing sample locations, the location of the release, the lateral limits of soil contamination, calculations estimating the quantity (in tons) of soil proposed for excavation, PID data, and copies of laboratory data.

If the investigation indicates that source removal is necessary and feasible, costs to complete the soil removal should be submitted to DES for per-approval using the "Authorization for Initial Response Action Form". A brief description of the source removal work and a budget breakdown of the costs to perform the work must be included on the form.

2.2.3 Groundwater Quality Monitoring

If groundwater contamination exceeding the Ambient Groundwater Quality Standards (AGQS) is identified, or significant quantities of left-in-place soils exceed the S-1 leaching based standards, DES may require a groundwater quality assessment prior to site closure. The assessment can be completed using the pre-approved *Groundwater Quality Assessment for Residential OPUF* task. This SOW consists of completing the following or as otherwise directed by DES: installation of up to 3 monitoring wells, (a minimum of one well shall be installed as close as possible to the source area in the presumed down gradient direction), collect groundwater sample(s), complete a well elevation survey (if all 3 wells are installed), and submit data results to DES. The data submittal shall include a site sketch showing sample locations, the location of the release, PID data, and copies of laboratory data. The use of small diameter wells using push probe technology can be used if suitable site conditions allow.

If Ambient Groundwater Quality Standards are exceeded, DES will require continued monitoring. Groundwater monitoring can be completed using the pre-approved *One Round of Groundwater Monitoring* SOW. DES typically requires two consecutive sampling events to demonstrate AGQS are met prior to site closure.

2.2.4 Residential Indoor Air Sampling

Where significant quantities of left-in-place soils exceed S-1 standards, DES may require indoor air sampling to demonstrate there is no risk to human health from inhalation of vapors. Indoor air sampling can be completed using the pre-approved *Residential Indoor Air Sampling* task. This SOW consists of completing a pre-sampling inspection conducted a minimum of 24 hours prior to sampling, collection of 3 four-hour time integrated indoor air samples (one each from the basement, first floor living space and an outdoor ambient sample) and submittal of data to DES. Analysis shall be for BTEX and naphthalene. The data submittal shall include copies of laboratory data and the completed "Residential Indoor Air Sampling Form".

3.0 Site Closure Criteria

To meet the site closure criteria listed in Env-Ws 412.18 the following site conditions must be demonstrated in accordance with the Risk Characterization and Management Policy:

(1) Inhalation, ingestion and dermal hazards are eliminated;
(2) Sources of groundwater contamination are eliminated; and
(3) Dissolved contaminant concentrations in groundwater do not exceed Ambient Ground Water Quality Standards (AGQS).

In order to demonstrate that inhalation hazards are eliminated:
(1) Soils must meet the NH S-1 standards; or
(2) Left-in-place soils which exceed NH S-1 standards are infeasible to remove because of proximity to support structures and are limited to small quantities that would not likely affect indoor air quality, or
(3) Where significant quantities of left-in-place soils exceed NH S-1 standards, time integrated indoor air sampling indicates the Residential Indoor Air Screening Levels or Chronic Cumulative Risk Levels are met.

In order to demonstrate that ingestion and dermal hazards are eliminated:
(1) Soils must meet the NH S-1 standards; or
(2) Where left-in-place soils exceed NH S-1 standards, the Direct Contact Risk-based Standards outlined in Appendix E of the DES Risk Characterization & Management Policy must be met; or
(3) An engineering control is constructed to prevent direct contact with contaminated soils.

In order to demonstrate that sources of groundwater contamination are eliminated and Ambient Ground Water Quality Standards are met:
(1) Soils must meet the NH S-1 standards; or
(2) Modeling is completed to demonstrate that the left-in-place soils will not cause an AGQS violation in groundwater; or
(3) Actual groundwater quality data shows no AGQS violation.